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## FACSIMILE COVER SHEET

To Office of Petitions	Total Pages Sent:	35
	(including cover sheet)	
Facsimile Number:	703-308-6916	Transmission Date: September 22, 2003

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ramachandran, et al. Docket No.: 98-P-7501-US  
Serial No: 09/204,706 Art Unit: 1763  
Date Filed: December 3, 1998  
TITLE: Removal of Post-RIE Polymer on Al/Cu Metal Line

## CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that the following papers are being transmitted by facsimile to the U.S. Patent and Trademark Office at 703-308-6916 on the date shown above:

- Renewed Petition for Revival of an Application for Patent ... (1 page)
- Copy of Petition Dismissal (2 pages)
- RCE Transmittal (1 original and 1 copy = 2 pages)
- Copy of Amendment dated 09/16/2002 (11 pages)
- Copy of Original Petition for Revival dated 05/14/2003 (18 pages)

Respectfully submitted,

*Natalie Swider*

Natalie Swider  
Legal Assistant

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**SEP 22 2003**

**PETITIONS OFFICE**

**Confirmation Respectfully Requested**

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#30

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ramachandran, et al. Docket No.: 98-P-7501-US  
Serial No.: 09/204,706 Art Unit: 1763  
Filed: December 3, 1998 Examiner: Olsen, A.  
For: Removal of Post-RIE Polymer on Al/Cu Metal Line

Mail Stop DAC  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**RENEWED Petition for Revival of an Application**  
**for Patent Abandoned Unintentionally under 37 CFR 1.137(b)**


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PETITIONS OFFICE

Dear Sir:

Applicants submitted a Petition for Revival on May 14, 2003. The petition was dismissed on September 2, 2003 for failure to include required elements of a petition for revival.

Enclosed herewith is a copy of the originally filed Petition for Revival along with a Request for Continued Examination and required RCE fees.

Respectfully submitted,



Ira S. Matsil  
Attorney for Applicants  
Reg. No. 35,272

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Dallas, TX 75252  
Tel: 972-732-1001  
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Ex 106

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Paper No. 28

THE LAW OFFICE OF JEROME J NORRIS  
1901 PENNSYLVANIA AVENUE SUITE 305  
WASHINGTON DC 20006

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SEP 02 2003

OFFICE OF PETITIONS

ON PETITION



In re Application of  
Ravikumar Ramachandran, et al.  
Application No. 09/204,706  
Filed: December 3, 1998  
Attorney Docket No. BLACK-USPA-103

FAX RECEIVED

This is a decision on the petition under 37 CFR 1.137(b), filed May 14, 2003, to revive the above-identified application. SEP 22 2003

PETITIONS OFFICE

The petition is **DISMISSED**.

Any request for reconsideration of this decision must be submitted within TWO (2) MONTHS from the mail date of this decision. Extensions of time under 37 CFR 1.136(a) are permitted. The reconsideration request should include a cover letter entitled "Renewed Petition under 37 CFR 1.137(b)." This is not final agency action within the meaning of 5 U.S.C. § 704.

The application became abandoned for failure to timely file a reply within the meaning of 37 CFR 1.113 to the final Office action mailed September 10, 2002. The proposed reply required for consideration of a petition to revive must be a Notice of Appeal (and appeal fee as required by 37 CFR 1.17(b), an amendment that *prima facie* places the application in condition for allowance, a Request for Continued Examination (RCE) under 37 CFR 1.14 or the filing of a continuing application. See MPEP 711.03(c)(III)(A)(2). Since the amendment submitted with the present petition does not *prima facie* place the application in condition for allowance, the reply required must be a Notice of Appeal (and appeal fee), RCE or the filing of a continuing application. See the attached Advisory Action.

Further correspondence with respect to this matter should be addressed as follows:

**By mail:** Mail Stop PETITION  
Commissioner for Patents  
Post Office Box 1450  
Alexandria, VA 22313-1450

**By hand:** Crystal Plaza Four, Suite 3C23  
2201 South Clark Place  
Arlington, VA 22202

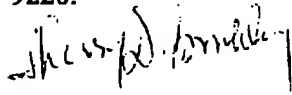
**By Fax:** (703) 308-6916  
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**Application No. 09/204,706**

**Page 2**

Telephone inquiries concerning this decision should be directed the undersigned at (703) 305-9220.



**Sherry D. Brinkley  
Petitions Examiner  
Office of Petitions  
Office of the Deputy Commissioner  
for Patent Examination Policy**

**Attachment: Advisory Action**

COPY

Patent

Trademark

Docket No. 98 P 7501 US 01

In re the application of:  
Ramachandran et al.

Serial #: 09/204,706

Title: REMOVAL OF POST-RIE POLYMER  
ON Al/Cu METAL LINE



COMMISSIONER OF PATENT & TRADEMARKS  
Washington, D.C. 20231

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## Fees

New Application (w/transmittal)

Preliminary Amendment

Notice of Appeal

Petition For Foreign Filing License

Appeal Brief

## Assignment

Small Entity Declaration

Priority Documents

Executed Declaration &amp; Power of Attorney

Sheets of Informal/Formal Drawings

☒ Other: Amendment under 37 CFR 1.116

Date: September 16, 2002

Thank you,  
Jerome J. Norris

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SEP 22 2003

PETITIONS OFFICE

**COPY****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

ATTY.'S DOCKET: 98 P 7501 US 01

#32

copy # G

In re the application of:	)	
Ramachandran et al.	)	Group Art: 1746
	)	
Serial No.: 09/204,706	)	Examiner: A. Olsen
	)	
Filing Date: December 3, 1998	)	
	)	
Title: REMOVAL OF POST-RIE POLYMER)	)	
ON Al/Cu METAL LINE	)	

**AMENDMENT UNDER 37 C.F.R. §1.116**

Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

In reply to the Office Action mailed September 10, 2002,  
which rejected the claims in the above-identified patent  
application, applicants respectfully request reconsideration,  
based upon the amendments hereinafter set forth.

**IN THE CLAIMS:**

~~1~~ 13. (5th Amendment) In a metal etch tool for removing  
post-RIE polymer rails formed on a Al/Cu metal line of a  
semiconductor structure, the improvement comprising:

[I] an integrated metal etch tool interfaceable with:

a) strip chamber means [for water only plasma] to strip  
photo-resist of a semiconductor composite structure subsequent  
to a RIE to limit thickness of sidewall polymer rails;

b) vacuum chamber means to chemically modify sidewall  
polymer rails [by supplying a mixture of an etching gas/acid  
neutralizing gas of] with HF/NH<sub>3</sub> to form a water soluble

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residue material of sidewall polymer rails left behind on [the] a Al/Cu metal line from the RIE process; and

c) [deionized water] rinse chamber means to remove [water] soluble material in deionized water.

4 16. (5th Amendment) In a metal etch tool for removing post-RIE polymer rails formed on a Al/Cu metal line of a semiconductor structure, the improvement comprising:

[I.] an integrated metal etch tool interfaceable with:

(a) vacuum chamber means to [provide a mixture of etching gas/acid neutralizing gas of HF/NH<sub>3</sub> to said structure to] form a water soluble residue material of sidewall polymer rails with HF/NH<sub>3</sub> left behind on Al/Cu metal line from the RIE process; and

(b) strip chamber means for down stream etching removal of photo-resist from said structure [by chemical downstream etching or plasma].

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CORRECTED VERSION OF THE AMENDED CLAIMS

13. (5th Amendment) In a metal etch tool for removing post-RIE polymer rails formed on a Al/Cu metal line of a semiconductor structure, the improvement comprising:

an integrated metal etch tool interfaceable with:

a) strip chamber means to strip photo-resist of a semiconductor composite structure subsequent to a RIE to limit thickness of sidewall polymer rails;

b) vacuum chamber means to chemically modify sidewall polymer rails with HF/NH<sub>3</sub> to form a water soluble residue material of sidewall polymer rails left behind on a Al/Cu metal line from the RIE process; and

c) rinse chamber means to remove [water] soluble material in deionized water.

14 16. (5th Amendment) In a metal etch tool for removing post-RIE polymer rails formed on a Al/Cu metal line of a semiconductor structure, the improvement comprising:

an integrated metal etch tool interfaceable with:

(a) vacuum chamber means to form a water soluble residue material of sidewall polymer rails with HF/NH<sub>3</sub> left behind on Al/Cu metal line from the RIE process; and

(b) strip chamber means for down stream etching removal of photo-resist from said structure.



REMARKS

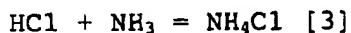
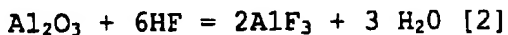
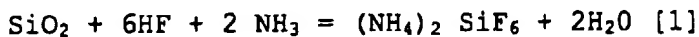
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The Official Action has again been carefully reviewed. The review indicates that the claims, as presently amended, recite patentable subject matter and should be allowed. Reconsideration and allowance are therefore respectfully requested.

Prior to contending with the grounds on which the rejections have been made, an overview of the improved integrated metal etch tool structure for removing post-RIE polymer rails from Al/Cu metal lines of a semiconductor structure will be provided to better define the integrated metal etch tool structure and to draw a clearer distinction between the invention structure and those of the cited references.

In the art of making semiconductor structures in which there must be removal of post-RIE polymer rails that are formed on a Al/Cu metal line, applicants have invented an integrated metal etch tool interfaceable with vacuum and deionized water rinse chamber means or strip, vacuum and deionized water rinse chamber means that removes sidewall polymer rails left behind after the metal (Al/Cu) RIE process.

The inventive structure strip, vacuum, and deionized water rinse chamber means interfaced with the metal etch tool performs the chemical reaction functions of:



(either post resist strip or prior to resist strip), to allow the products from both etching and neutralization reaction to be soluble in deionized water.

COPY

Note is taken of the manner in which applicants' claims have been construed in regard to the means plus function section of paragraph 6 of 35 USC §112; however, applicants respectfully disagree with this construction as well as the conclusion that claims 13 and 16 fail the three-prong analysis on allegations that applicants have additionally included either further modifications of sufficient structure, material or acts for achieving the specified function.

Firstly, Section 112, paragraph 6, states that a means-plus-function claim (shall be construed to cover the corresponding structure... described in the specification." (emphasis added). In this regard, the Federal Circuit holds that, pursuant to this provision, structure disclosed in the specification is "corresponding" structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing section 112, Par. 6. Braun Medical Inc. v. Abbott Laboratories, 124 F.3d 1419, 43 U.S.P.Q. 2d 1896, 1900 (Fed. Cir. 1997), citing O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1583, 42 U.S.P.Q.2d 1777, 1782 (Fed. Cir. 1997).

But in any case, the amendment of claims 13 and 16 is such as to dispel any construction of these claim not in compliance with the strictures of 35 USC §112, ¶6.

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Claims 13-17 were again rejected as being anticipated by Kawasaki et al. under 35 USC 102(b).

Applicants respectfully traverse the rejection and request reconsideration for the following reasons.

Kawasaki et al. only disclose a method of removing residual corrosive compounds by plasma etching and washing. The apparatus therefor (see col. 3 lines 22-44) essentially comprises eight parts - however, the apparatus lacks a metal etch tool interfaceable with strip chamber means, vacuum chamber means and water rinse chamber means to remove soluble material in deionized water.

Withdrawal of the rejection is respectfully requested.

Claims 13-15 were again rejected as being anticipated by Okutani under 35 U.S.C 102(b).

Applicants respectfully traverse this rejection and request reconsideration for reasons hereinafter set forth.

Okutani disclose a method of and apparatus for producing semiconductor devices. These apparatuses for producing semiconductor devices incorporates a dry processing mechanism and a wet processing mechanism for the wafers, and a carriage mechanism to reduce the space for the apparatus for dry-processing and wet-processing. There is no reference to or mention of, the need for apparatus to remove the products of etching and products from neutralization of the etchings to

prevent the sidewalls from trapping chlorine and water species. Therefore it is hardly surprising that Okutani's apparatus lacks an integrated metal etch tool interfaceable with strip, vacuum and rinse chamber means to remove the etchant reaction products and the neutralization of those etchant products, both of which are soluble, in a deionized water rinse chamber.

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Withdrawal of the rejection is respectfully requested.

Claims 16 and 17 were again rejected as being anticipated by Chen et al. under 35 U.S.C. 102(b).

Applicants respectfully traverse this rejection and request reconsideration for reasons hereinafter set forth.

Chen et al. only disclose a vacuum chamber for passivating and stripping to inhibit corrosion of a semiconductor substrate, wherein the chamber strips the polymeric remnant resist remaining on the substrate. Mere conventional processing equipment is used (see col. 3, lines 17-19) to passivate and strip the substrate. In fact, FIG. 2 of Chen et al. is revealing as the most comprehensive depiction of its vacuum chamber arrangement. Notably absent from this figure is any reference to or mention of, an integrated metal etch tool interfaceable with vacuum chamber means and strip chamber means, as those now recited in applicants' claims as amended.

Withdrawal of the rejection is respectfully requested.

Claims 16 and 17 were again rejected as being anticipated by Davis et al. under 35 U.S.C. 102(b).

Applicants respectfully traverse this rejection and request reconsideration for the reasons which follow.

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Davis et al. disclose apparatus for transferring work pieces such as integrating circuits. The apparatus comprises:

- (a) a vacuum carrier having a sealable carrier door and capable of maintaining a vacuum with the workpieces therein, the carrier door movable between an open and close position;
- (b) a chamber adapted to receive the carrier and selective move and carrier door and having a closeable port; the chamber capable of maintaining an applied vacuum;
- (c) a moveable arm located within the chamber and capable of engaging the workpieces, the arm moveable into the carrier and through the port to transfer the workpieces;
- (d) a transfer mechanism located exterior to the chamber and adapted to transfer the workpieces from the arm to a non-vacuum processing station; and
- (e) a control system selectively applying vacuum and ambient pressure to the chamber.

While Davis et al. disclose a multi-chamber apparatus, this apparatus clearly lacks chamber means to perform semiconductor structure chemistry (removal of etchant and neutralization products) to permit a final rinse step using only deionized water.

In point of fact, Davis et al. clearly lacks the apparatus combination of either the vacuum and rinse chamber means interfaceable with a metal etch tool as required in claims 16-17.

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As such, Davis et al. fails to anticipate applicants' claims as presently amended.

Withdrawal of the rejection is respectfully requested.

The notes regarding claim interpretation, which is a matter of law for a district court or the CAFC, are misplaced, as it is error to regard the functions of apparatus as a method limitation, inasmuch as the 6<sup>th</sup> paragraph of 35 U.S.C. §112 clearly permits means plus function language to be includable in a claim as a necessary and indispensable condition to satisfy the "means plus function" requirements.

This necessity is clearly shown in applicants' specification on page 8, lines 21-24 where it is stated that, if the etchant and neutralization reactions do not occur in the vacuum chamber, the sidewall can trap chlorine and water species - thereby resulting in a corrosion cycle where the chlorine acts as a catalyst. In that case, reactions 4 and 5 (as shown on page 8, lines 25-28 will occur). The novel arrangement of applicants' integrated metal etch tool interfaceable with the vacuum and strip chambers in claims 16 and 17 do not permit the small time window between metal RIE and the sidewall removal which would allow corrosion to transpire. Further, the low reaction pressure (under 10 m Torr) enables the H<sub>2</sub>O reaction product to escape. And, the low

reaction pressure also enables easy integration of the chamber designed to carry out reactions 1-3 with the metal RIE process tool.

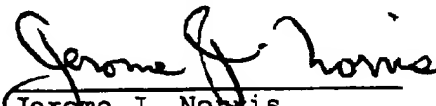
As stated in applicants' specification on page 9, the vacuum chamber may be interfaced with the metal etch tool or left as a stand-alone chamber for introducing the reaction mixture; however, applicants have recited the most effective arrangement, which is the vacuum chamber interfaced with the metal etch tool.

Davis et al. clearly lacks any reference to or mention of such an arrangement.

Note is taken of the objections raised to claims 13 and 16; however, in view of the amendments made deleting "I", these objections are no longer applicable.

In view of the foregoing amendments, remarks and arguments, it is believed that the application is now in condition for allowance and early notification of the same is earnestly solicited.

Respectfully submitted,

  
Jerome J. Norris  
Attorney for Applicants  
Reg. No. 24,696

Jerome J. Norris, Esq.  
LAW OFFICES OF Jerome J. Norris  
1901 Pennsylvania Avenue, N.W., Suite 305  
Washington, DC 20009  
Telephone: (202) 737-4410  
Facsimile: (202) 737-3315  
Dated: September 16, 2002

COPY

Patent

Trademark

Docket No. 98 P 7501 US

In re the application of:  
Ramachandran et al.

Serial #: 09/204,706

**COPY**

Title: REMOVAL OF POST-RIE POLYMER AN Al/Cu METAL LINE

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- ☒ Other – 1) PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT  
ABANDONED UNINTENTIONALLY UNDER 37 C.F.R. §1.137(b)  
(WITH TRANSMITTAL), AMENDMENT UNDER 37 C.F.R §1.116 and  
copy of Notice of Abandonment  
2) CREDIT CARD AUTHORIZATION FORM (PTO-2038)

Date: MAY 14, 2003

Thank you,  
Jerome J. Norris



PTO-2038 (02-2000)

Approved for use through 01/31/2003. OMB 0651-0043

United States Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Credit Card Expiration Date: July 2005

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Signature:

Date: 5/14/03

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## Request and Payment Information

Description of Request and Payment Information: PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137b

Patent Fee	Patent Maintenance Fee	Trademark Fee	Other Fee
Application No. 09/204,706	Application No.	Serial No.	IDON Customer No.
Patent No.	Patent No.	Registration No.	
Attorney Docket No. 98 P 7501 US 01		Identify or Describe Mark	

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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ATTY.'S DOCKET: 98 P 7501 US 01

**In re the application of:**  
**Ramachandran et al.**

Serial No.: 09/204,706

**Filing Date: December 3, 1998**

Title: REMOVAL OF POST-RIE POLYMER  
ON Al/Cu METAL LINE

Group Art: 1746

Examiner: A. Olsen

Box DAC  
Commissioner for Patents  
Alexandria, VA 22313-1450

**PETITION FOR REVIVAL OF AN APPLICATION  
FOR PATENT ABANDONED UNINTENTIONALLY UNDER 37 C.F.R. §1.137(b)**

1. The applicant became abandoned on 3/25/03.
2. This application became abandoned because the failure to prosecute was an unintentional delay. The entire delay in filing the required reply from the due date until the filing of the petition was unintentional 37 C.F.R. §1.137(b)(3).
3. Response or action required.  
  
☒ is attached.
4. Application status is:  
  
☒ Other than small entity - fee \$1,300.00

COPY

5. The Petition Fee in the amount of the \$1,300.00 is authorized to be charged to credit card on attached PTO Form 2038.

Respectfully submitted,



Jerome J. Norris, Esq.  
Attorney for Applicants  
Reg. No. 24,696

Law Offices of Jerome J. Norris  
Suite 305  
1901 Pennsylvania Avenue, NW  
Washington, DC 20006  
202-737-4410

Date: May 14, 2003

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTY.'S DOCKET: 98 P 7501 US 01

In re the application of: )  
Ramachandran et al. ) Group Art: 1746  
Serial No.: 09/204,706 ) Examiner: A. Olsen  
Filing Date: December 3, 1998 )  
Title: REMOVAL OF POST-RIE POLYMER )  
ON Al/Cu METAL LINE )

COPY

AMENDMENT UNDER 37 C.F.R. §1.116

Commissioner For Patents  
P.O. Box 1450  
Arlington, VA 22313-1450

Sir:

Responsive to the Office Action of September 10, 2002,  
please amend the application as follows:

IN THE CLAIMS:

13. (5th Amendment) In a metal etch tool for removing post-RIE polymer rails formed on a Al/Cu metal line of a semiconductor structure, the improvement comprising:

[I] an integrated metal etch tool interfaceable with:

a) strip chamber means [for water only plasma] to strip photo-resist of a semiconductor composite structure subsequent to a RIE to limit thickness of sidewall polymer rails;

b) vacuum chamber means to chemically modify sidewall polymer rails [by supplying a mixture of an etching gas/acid neutralizing gas of HF/NH<sub>3</sub>] to form a water soluble residue material of sidewall polymer rails left behind on [the] a Al/Cu metal line from the RIE process; and

c) deionized water rinse chamber means to [remove] rinse [water] soluble material.

COPY

16. (5th Amendment) In a metal etch tool for removing post-RIE polymer rails formed on a Al/Cu metal line of a semiconductor structure, the improvement comprising:

[I.] an integrated metal etch tool interfaceable with:

(a) vacuum chamber means to [provide a mixture of etching gas/acid neutralizing gas of HF/NH<sub>3</sub> to said structure to] form a water soluble residue material of sidewall polymer rails [left behind] on Al/Cu metal line from [the] a RIE process; and

(b) strip chamber means to strip down stream etched [for stream removal of] photo-resist from said structure [by chemical downstream etching or plasma].

CORRECTED VERSION OF THE AMENDED CLAIMS

COPY

13. (5th Amendment) In a metal etch tool for removing post-RIE polymer rails formed on a Al/Cu metal line of a semiconductor structure, the improvement comprising:

an integrated metal etch tool interfaceable with:

a) strip chamber means to strip photo-resist of a semiconductor composite structure subsequent to a RIE to limit thickness of sidewall polymer rails;

b) vacuum chamber means to chemically modify sidewall polymer rails to form a water soluble residue material of sidewall polymer rails left behind on a Al/Cu metal line from the RIE process; and

c) deionized water rinse chamber means to rinse soluble material.

16. (5th Amendment) In a metal etch tool for removing post-RIE polymer rails formed on a Al/Cu metal line of a semiconductor structure, the improvement comprising:

an integrated metal etch tool interfaceable with:

(a) vacuum chamber means to form a water soluble residue material of sidewall polymer rails on Al/Cu metal line from a RIE process; and

(b) strip chamber means to strip down stream etched photo-resist from said structure.

REMARKS

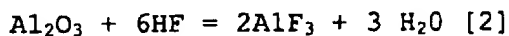
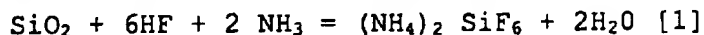
COPY

Upon reviewing the Official Action, the review indicates that the claims, as presently amended, now recite patentable subject matter and should be allowed. Accordingly, reconsideration and allowance are respectfully requested.

In advance of addressing the grounds on which the rejections are based, a summarization of the improved integrated metal etch tool structure for removing post-RIE polymer rails from Al/Cu metal lines of a semiconductor structure will be provided to better define the integrated metal etch tool structure within the requirements of 35 USC 112, sixth paragraph and to draw a clearer distinction between the invention structure and those contained in the cited references.

In the prior art of making semiconductor structures in which it is necessary to remove post-RIE polymer rails that are formed on a Al/Cu metal line, applicants have invented an integrated metal etch tool interfaceable with vacuum and deionized water rinse chamber means or strip, vacuum and deionized water rinse chamber means that removes sidewall polymer rails left behind after the metal (Al/Cu) RIE process.

The inventive structure strip, vacuum, and deionized water rinse chamber means interfaced with the metal etch tool performs the chemical reaction functions of:



(either post resist strip or prior to resist strip), to allow the products from both etching and neutralization reaction to be soluble in deionized water.

The manner in which applicants' claims are construed in regard to the means-plus-function criteria of paragraph 6 of 35 USC §112 have been noted; however, applicants have amended claims 13 and 16 in an earnest attempt to satisfy the three-prong analysis test relied upon in the Office Action.

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Section 112, paragraph 6, states that a means-plus-function claim (shall be construed to cover the corresponding structure... described in the specification." (emphasis added). In this regard, the Federal Circuit holds that, pursuant to this provision, structure disclosed in the specification is "corresponding" structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing section 112, Par. 6. Braun Medical Inc. v. Abbott Laboratories, 124 F.3d 1419, 43 U.S.P.Q. 2d 1896, 1900 (Fed. Cir. 1997), citing O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1583, 42 U.S.P.Q.2d 1777, 1782 (Fed. Cir. 1997).

The amendment of claims 13 and 16 is such as to dispel any construction of these claim not in compliance with the strictures of 35 USC §112, ¶6.

Claims 13-17 were rejected as being anticipated by Kawasaki et al. under 35 USC 102(b).

Applicants respectfully traverse the rejection and request reconsideration for the following reasons hereafter set forth.

A review of Kawasaki et al. shows that it only disclose a method of removing residual corrosive compounds by plasma etching and washing. The apparatus therefor (see col. 3 lines 22-44) essentially comprises eight parts - however, the apparatus lacks a metal etch tool interfaceable with strip chamber means, vacuum chamber means and water rinse chamber means to remove soluble material in deionized water.

For these reasons, Kawasaki et al. fails to anticipate the claims as amended.

Withdrawal of the rejection is respectfully requested.

Claims 13-15 were rejected as being anticipated by Okutani under 35 U.S.C 102(b).

Applicants respectfully traverse this rejection and request reconsideration for the reasons which follow.



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A close review of Okutani reveals that it only disclose a method of and apparatus for producing semiconductor devices. These apparatuses for producing semiconductor devices incorporates a dry processing mechanism and a wet processing mechanism for the wafers, and a carriage mechanism to reduce the space for the apparatus for dry-processing and wet-processing. Significantly, there is no reference to or mention of, the need for apparatus to remove the products of etching and products from neutralization of the etchings to prevent the sidewalls from trapping chlorine and water species. Therefore it is hardly surprising that Okutani's apparatus lacks an integrated metal etch tool interfaceable with strip, vacuum and rinse chamber means to remove the etchant reaction products and the neutralization of those etchant products, both of which are soluble, in a deionized water rinse chamber.

Accordingly, Okutani fails to anticipate claims 13 to 15 as presently amended.

Withdrawal of the rejection is respectfully requested.

Claims 16 and 17 were rejected as being anticipated by Chen et al. under 35 U.S.C. 102(b).

Applicants respectfully traverse this rejection and request reconsideration for reasons which follow.

A review of Chen et al. shows that it only disclose a vacuum chamber for passivating and stripping to inhibit corrosion of a semiconductor substrate, wherein the chamber strips the polymeric remnant resist remaining on the substrate. Admittedly, mere conventional processing equipment is used (see col. 3, lines 17-19) to passivate and strip the substrate. In fact, FIG. 2 of Chen et al. is revealing as the most comprehensive depiction of its vacuum chamber arrangement. Notably absent from the text describing FIG. 2 is any reference to or mention of, an integrated metal etch tool interfaceable with vacuum chamber means and strip chamber means, as those now recited in applicants' claims as amended.

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For these reasons Chen et al. fails to anticipate the claims as presently amended.

Withdrawal of the rejection is respectfully requested.

Claims 16 and 17 were rejected as being anticipated by Davis et al. under 35 U.S.C. 102(b).

Applicants respectfully traverse this rejection and request reconsideration for the reasons hereinafter provided.

Careful scrutiny of Davis et al. shows that it disclose apparatus for transferring work pieces such as integrating circuits. The apparatus comprises:

- (a) a vacuum carrier having a sealable carrier door and capable of maintaining a vacuum with the workpieces therein, the carrier door movable between an open and close position;
- (b) a chamber adapted to receive the carrier and selective move and carrier door and having a closeable port; the chamber capable of maintaining an applied vacuum;
- (c) a moveable arm located within the chamber and capable of engaging the workpieces, the arm moveable into the carrier and through the port to transfer the workpieces;
- (d) a transfer mechanism located exterior to the chamber and adapted to transfer the workpieces from the arm to a non-vacuum processing station; and
- (e) a control system selectively applying vacuum and ambient pressure to the chamber.

Although Davis et al. disclose a multi-chamber apparatus, this apparatus clearly lacks chamber means to perform semiconductor structure chemistry (removal of etchant and neutralization products) to permit a final rinse step using only deionized water.

It is a fact that Davis et al. clearly lacks the apparatus combination of either the vacuum and rinse chamber means interfaceable with a metal etch tool as required in claims 16-17.

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For these reasons, Davis et al. fails to anticipate applicants' claims as presently amended.

Withdrawal of the rejection is respectfully requested.

The Official Action notes regarding claim interpretation (which is a matter of law for a district court or the CAFC) are misplaced, as it is error to regard the functions of apparatus as a method limitation, since the 6<sup>th</sup> paragraph of 35 U.S.C. §112 clearly permits means plus function language to be includable in a claim as a necessary and indispensable condition to satisfy the "means plus function" requirements.

The foundation for this necessity is clearly shown in applicants' specification on page 8, lines 21-24 where it is stated that, if the etchant and neutralization reactions do not occur in the vacuum chamber, the sidewall can trap chlorine and water species - thereby resulting in a corrosion cycle where the chlorine acts as a catalyst. In that case, reactions 4 and 5 (as shown on page 8, lines 25-28) will occur. The novel arrangement of applicants' integrated metal etch tool interfaceable with the vacuum and strip chambers in claims 16 and 17 do not permit the small time window between metal RIE and the sidewall removal which would allow corrosion to transpire. Furtherstill, the low reaction pressure (under 10 m Torr) enables the H<sub>2</sub>O reaction product to escape. Additionally, the low reaction pressure also enables easy integration of the chamber designed to carry out reactions 1-3 with the metal RIE process tool.

As is abundantly made clear in applicants' specification on page 9, the vacuum chamber may be interfaced with the metal etch tool or left as a stand-alone chamber for introducing the reaction mixture; however, applicants have recited the most effective arrangement, which is the vacuum chamber interfaced with the metal etch tool.

Davis et al. clearly lacks any reference to or mention of such an arrangement.

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Note is taken of the objections raised to claims 13 and 16; however, in view of the amendments made deleting "I", these objections are no longer applicable.

In view of the foregoing amendments, remarks and arguments, it is believed that the application is now in condition for allowance and early notification of the same is earnestly solicited.

Respectfully submitted,



Jerome J. Norris

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/204,706	12/03/1998	RAVIKUMAR RAMACHANDRAN	98-P-7501-US	5853

7590 03/25/2003

The Law Office of Jerome J Norris  
1901 Pennsylvania Avenue Suite 305  
Washington, DC 20006

EXAMINER

OLSEN, ALLAN W

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 03/25/2003

25

Please find below and/or attached an Office communication concerning this application or proceeding.

COPY

**Notice of Abandonment**

Application No.

09/204,706

Examiner

Allan W. Olsen

Applicant(s)

RAMACHANDRAN ET AL.

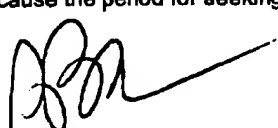
Art Unit

1763

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 10 September 2002.
  - (a) ☐ A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b) ☒ A proposed reply was received on 16 September 2002, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.  
 (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c) ☐ A reply was received on \_\_\_\_\_ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
  - (d) ☐ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a) ☐ The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
  - (b) ☐ The submitted fee of \$\_\_\_\_\_ is insufficient. A balance of \$\_\_\_\_\_ is due.  
 The issue fee required by 37 CFR 1.18 is \$\_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d), is \$\_\_\_\_\_.
  - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a) ☐ Proposed corrected drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

  
**SHRIVE P. GECK**  
 SUPERVISORY PATENT EXAMINER  
 TECHNOLOGY CENTER 1700

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

COPY

<b>Interview Summary</b>	Applicati n N .		Applicant(s)	
	09/204,706		RAMACHANDRAN ET AL.	
	Examiner		Art Unit	
	Allan W. Olsen		1763	

All participants (applicant, applicant's representative, PTO personnel):

(1) Allan W. Olsen. (3)\_\_\_\_\_

(2) Jerome Norris. (4)\_\_\_\_\_

Date of Interview: 11 March 2003.

Type: a) ☒ Telephonic b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.

If Yes, brief description: \_\_\_\_\_.

Claim(s) discussed: \_\_\_\_\_.

Identification of prior art discussed: \_\_\_\_\_.

Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: See Continuation Sheet.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

\_\_\_\_\_  
Examiner's signature, if required

## Summary of Record of Interview Requirements

# COPY

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

#### Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

##### Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner should check the appropriate box at the bottom of the Form which informs the applicant that the submission of a separate record of the substance of the interview as a supplement to the Form is not required.

It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

#### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.



Continuation Sheet (PTO-413)

Application No. 00/204,706 **COPY**

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Because the six month statutory time limit for applicant's response to the Office action of 9/10/2002 had elapsed, the examiner called Mr. Norris to verify whether or not applicant intended to abandon the application. Mr. Norris informed the examiner that an After-final amendment was filed on 9/16/2002. Mr. Norris faxed a copy of a date stamped card that was returned to Mr. Norris that acknowledged PTO's receipt of the amendment on 9/16/2002. Mr. Norris' fax to the examiner also included a copy of the amendment that was filed on 9/16/2002. The examiner indicated to Mr. Norris that he would be inquiring as to the proper manner of handling this situation. The examiner placed a follow-up call to Mr. Norris on March 21, 2003 to relay that which he had learned regarding the proper procedure for this situation. Specifically, the examiner was informed by his supervisor that if the after final amendment places the application in condition for allowance, then the application should be allowed. Otherwise, given the passage of 6 months from the mailing of the final rejection, the application is abandoned.